Chapter 2
Mechanics of Futures Markets
Futures Contracts

- Available on a wide range of assets
- Exchange traded
- Specifications need to be defined:
  - What can be delivered,
  - Where it can be delivered, &
  - When it can be delivered
- Settled daily
Convergence of Futures to Spot (Figure 2.1, page 29)
Margins

- A margin is cash or marketable securities deposited by an investor with his or her broker.
- The balance in the margin account is adjusted to reflect daily settlement.
- Margins minimize the possibility of a loss through a default on a contract.
**Margin Cash Flows**

- A trader has to bring the balance in the margin account up to the initial margin when it falls below the maintenance margin level.
- A member of the exchange clearing house only has an initial margin and is required to bring the balance in its account up to that level every day.
- These daily margin cash flows are referred to as variation margin.
- A member is also required to contribute to a default fund.
Example of a Futures Trade (page 27-29)

An investor takes a long position in 2 December gold futures contracts on June 5

- contract size is 100 oz.
- futures price is US$1,450
- initial margin requirement is US$6,000/contract (US$12,000 in total)
- maintenance margin is US$4,500/contract (US$9,000 in total)
A Possible Outcome (Table 2.1, page 30)

<table>
<thead>
<tr>
<th>Day</th>
<th>Trade Price ($)</th>
<th>Settle Price ($)</th>
<th>Daily Gain ($)</th>
<th>Cumul. Gain ($)</th>
<th>Margin Balance ($)</th>
<th>Margin Call ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1,450.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12,000</td>
</tr>
<tr>
<td>1</td>
<td>1,441.00</td>
<td>−1,800</td>
<td>−1,800</td>
<td></td>
<td>10,200</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1,438.30</td>
<td>−540</td>
<td>−2,340</td>
<td></td>
<td>9,660</td>
<td></td>
</tr>
<tr>
<td>.....</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1,436.20</td>
<td>−780</td>
<td>−2,760</td>
<td></td>
<td>9,240</td>
<td></td>
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<tr>
<td>7</td>
<td>1,429.90</td>
<td>−1,260</td>
<td>−4,020</td>
<td></td>
<td>7,980</td>
<td>4,020</td>
</tr>
<tr>
<td>8</td>
<td>1,430.80</td>
<td>180</td>
<td>−3,840</td>
<td></td>
<td>12,180</td>
<td></td>
</tr>
<tr>
<td>.....</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
<td>.....</td>
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<td></td>
</tr>
<tr>
<td>16</td>
<td>1,426.90</td>
<td>780</td>
<td>−4,620</td>
<td></td>
<td>15,180</td>
<td></td>
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</table>
Margin Cash Flows When Futures Price Increases
Margin Cash Flows When Futures Price Decreases

Diagram:
- Clearing House
- Clearing House Member
  - Broker
  - Long Trader
- Clearing House Member
  - Broker
  - Short Trader
Some Terminology

- Open interest: the total number of contracts outstanding
  - equal to number of long positions or number of short positions
- Settlement price: the price just before the final bell each day
  - used for the daily settlement process
- Volume of trading: the number of trades in one day
Key Points About Futures

- They are settled daily
- Closing out a futures position involves entering into an offsetting trade
- Most contracts are closed out before maturity
Crude Oil Trading on May 14, 2013 *(Table 2.2, page 36)*

<table>
<thead>
<tr>
<th></th>
<th>Open</th>
<th>High</th>
<th>Low</th>
<th>Prior Settle</th>
<th>Last Trade</th>
<th>Change</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun 2013</td>
<td>94.93</td>
<td>95.66</td>
<td>94.50</td>
<td>95.17</td>
<td>94.72</td>
<td>−0.45</td>
<td>162,901</td>
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<tr>
<td>Aug 2013</td>
<td>95.24</td>
<td>95.92</td>
<td>94.81</td>
<td>95.43</td>
<td>95.01</td>
<td>−0.42</td>
<td>37,830</td>
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<tr>
<td>Dec 2013</td>
<td>93.77</td>
<td>94.37</td>
<td>93.39</td>
<td>93.89</td>
<td>93.60</td>
<td>−0.29</td>
<td>27,179</td>
</tr>
<tr>
<td>Dec 2014</td>
<td>89.98</td>
<td>90.09</td>
<td>89.40</td>
<td>89.71</td>
<td>89.62</td>
<td>−0.09</td>
<td>9,606</td>
</tr>
<tr>
<td>Dec 2015</td>
<td>86.99</td>
<td>87.33</td>
<td>86.94</td>
<td>86.99</td>
<td>86.94</td>
<td>−0.05</td>
<td>2,181</td>
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</tbody>
</table>
Collateralization in OTC Markets

- It is becoming increasingly common for transactions to be collateralized in OTC markets.
- Consider transactions between companies A and B.
- These might be governed by an ISDA Master agreement with a credit support annex (CSA).
- The CSA might require A to post collateral with B equal to the value to B of its outstanding transactions with B when this value is positive.
Collateralization in OTC Markets continued

- If A defaults, B is entitled to take possession of the collateral
- The transactions are not settled daily and interest is paid on cash collateral
- See Business Snapshot 2.2 for how collateralization affected Long Term Capital Management when there was a “flight to quality” in 1998.
Clearing Houses and OTC Markets

- Traditionally most transactions have been cleared bilaterally in OTC markets.
- Following the 2007-2009 crisis, there has been a requirement for most standardized OTC derivatives transactions between dealers to be cleared through central counterparties (CCPs).
- CCPs require initial margin, variation margin, and default fund contributions from members similarly to exchange clearing houses.
Bilateral Clearing vs Central Clearing House
New Regulations

- New regulations for trades between dealers that are not cleared centrally require dealers to post both initial margin and daily variation margin.
- The initial margin is posted with a third party.
Delivery

If a futures contract is not closed out before maturity, it is usually settled by delivering the assets underlying the contract. When there are alternatives about what is delivered, where it is delivered, and when it is delivered, the party with the short position chooses.

A few contracts (for example, those on stock indices and Eurodollars) are settled in cash.
Questions

- When a new trade is completed what are the possible effects on the open interest?
- Can the volume of trading in a day be greater than the open interest?
Types of Orders

- Limit
- Stop-loss
- Stop-limit
- Market-if touched

- Discretionary
- Time of day
- Open
- Fill or kill
Regulation of Futures

In the US, the regulation of futures markets is primarily the responsibility of the Commodity Futures and Trading Commission (CFTC).

Regulators try to protect the public interest and prevent questionable trading practices.
Accounting & Tax

- Ideally hedging profits (losses) should be recognized at the same time as the losses (profits) on the item being hedged.
- Ideally profits and losses from speculation should be recognized on a mark-to-market basis.
- Roughly speaking, this is what the accounting and tax treatment of futures in the U.S. and many other countries attempt to achieve.
### Forward Contracts vs Futures Contracts (Table 2.3, page 43)

<table>
<thead>
<tr>
<th></th>
<th>FORWARDS</th>
<th>FUTURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private contract</td>
<td>Private contract between 2 parties</td>
<td>Exchange traded</td>
</tr>
<tr>
<td></td>
<td>Non-standard contract</td>
<td>Standard contract</td>
</tr>
<tr>
<td>Usually 1 specified</td>
<td>Usually 1 specified delivery date</td>
<td>Range of delivery dates</td>
</tr>
<tr>
<td>delivery date</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Settled at end of</td>
<td>Settled at end of contract</td>
<td>Settled daily</td>
</tr>
<tr>
<td>contract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery or final</td>
<td>Delivery or final cash settlement usually</td>
<td>Contract usually closed</td>
</tr>
<tr>
<td>cash settlement</td>
<td>occurs</td>
<td>out prior to maturity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some credit risk</td>
<td></td>
<td>Virtually no credit risk</td>
</tr>
</tbody>
</table>

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Foreign Exchange Quotes

- Futures exchange rates are quoted as the number of USD per unit of the foreign currency.
- Forward exchange rates are quoted in the same way as spot exchange rates. This means that GBP, EUR, AUD, and NZD are quoted as USD per unit of foreign currency. Other currencies (e.g., CAD and JPY) are quoted as units of the foreign currency per USD.